AKSEL'ROD, Z.M. (Leningrad)

Investigation of a balance wheel-hair spring system at small oscillation periods of the balance wheel. Izv.AN SSSR. Otd. tekh.nauk no.10:84-89 O'55. (MLRA 9:1)
(Chronometer)

124-1957-1-152

Translation from: Referativnyy zhurnal, Mekhanika, 1957, Nr 1, p 16 (USSR)

AUTHOR: Aksel'rod, Z. M.

TITLE: Theoretical and Experimental Investigation of Clockwork Mechanisms Having a Free Anchor Motion With a Short Oscillatory Period of the Balance Wheel (Teoreticheskoye i eksperimental'noye issledovaniye chasovykh mekhanizmov so svobodnym ankernym khodom s malym periodom kolebaniya balansa)

PERIODICAL: Sb. statey Leningr. in-ta tochnoy mekhan. i optiki, 1955, Nr 17, pp 3-29

ABSTRACT: The present investigation of clockwork mechanisms having a short oscillatory period is intended for their application in the measurement of brief time intervals. By integrating the nonlinear equations of the oscillating system of the mechanism, wherein account is taken of a constant friction and a resistance proportional to the square of the speed of the balance, formulas are derived for the computation of the relationship between the oscillatory period and the amplitude and between the amplitude and the moment on the escape wheel. An analysis of these formulas shows that, in order to maintain isochronic motion

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Theoretical and Experimental Investigation of Clockwork (cont.)

when the oscillatory period of the balance is reduced (as a result of a decrease of its moment of inertia and an increase in the stiffness of the coil spring), the moment on the escape wheel must be increased. An experimental investigation is described in substantiation of the theoretical results. The smallest oscillatory period, 0.0047 to 0.0030 sec, was attained on a watch balance with free anchor motion. The starting-impulse device on instruments intended for the measurement of brief time periods should impart to the balance an initial amplitude that should be as close as possible to its steady-state amplitude.

A. S. Alekseyev

1. Clocks--Mechanism--Theoretical analysis

Card 2/2

124-1957-1-154

Translation from: Referativnyy zhurnal, Mekhanika, 1957, Nr 1, p 17 (USSR)

AUTHOR: Aksel'rod, Z. M.

TITLE: Comparative Investigation of the Operational Accuracy of Regulators Having Free Anchor Motion (Sravnitel'noye issledovaniye regulyatorov so svobodnym ankernym khodom po tochnosti deystviya)

PERIODICAL: Sb. st. Leningr. in-ta tochnoy mekhan. i optiki, 1955, Nr 17, pp 30-48

ABSTRACT: Equations are obtained for the relationship between the basic parameters of a regulator having a free anchor motion due to either an unbalanced fork or an impulse angle between the tooth on the escape wheel and the pallet. A comparative study of free anchor motions is carried out and it is shown that the basic varieties of free anchor motion provide roughly the same accuracy in the clockwork mechanism.

A. S. Alekseyev

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1. Clocks--Mechanisms--Theoretical analysis

SOV/124-57-7-7541

Translation from: Referativnyy zhurnal. Mekhanika, 1957, Nr 7, p 12 (USSR)

AUTHOR: Aksel'rod, Z. M.

TITLE: An Investigation of the Effect of Varying the Parameters of a Constrained Watch Escapement on the Period and Amplitude of the Balance Vibrations (Issledovaniye vliyaniya izmeneniya parametrov spuskovogo regulyatora s nesvobodnym khodom na period i amplitudu kolebaniya balansa)

PERIODICAL: Sb. statey Leningr. in-ta tochnoy mekhan. i optiki, 1955, Nr 17, pp 49-63

ABSTRACT: For the case of a constrained watch escapement the author investigates the effect exerted by the various individual escapement parameters on the period and amplitude of the vibrations of the balance. Methods are proposed for selecting for the parameters those values from which any minor deviations, such as frequently occur in mass-production processes, will not greatly affect the balance-vibration period.

Card 1/1

A. S. Alekseyev

SOV/124-58-1-110

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 1, p 14 (USSR)

AUTHOR: Aksel'rod, Z. M.

TITLE: Experimental Investigation of the Free Damped Oscillations of a Balance-wheel - Hairspring System (Eksperimental'noye issledovaniye svobodnykh zatukhayushchikh kolebaniy sistemy balans -- volosok)

PERIODICAL: Sb. statey Leningr. in-ta tochnoy mekhan. i optiki, 1955, Nr 17, pp 64-74

ABSTRACT: A description of experimental data on the study of the free (damped) oscillations of a clock-type balance wheel. On the basis of qualitative considerations the author derives conclusions relative to the effect on the damping rate of dry, linear, and second-power friction.

Yu. I. Neymark

Card 1/1

AKSELROD, Z. M.

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PHASE I BOOK EXPLOTATION

AUTHOR: See Table of Contents

TITLE: Theory and Design of Instrument-components in Precision Mechanics (Teoriya i raschet elementov priborov tochnoy mekhaniki); Collected articles, Nr 22(Sbornik statey, Vyp. 22)

PUB. DATA: Gos. nauchno-tekhn. izd-vo mashinostroitel'noy literatury, Moscow-Leningrad, 1957, 168 pp. 6500 copies

ORIG. AGENY: Leningradskiy institut tochnoy mekhaniki i optiki

EDITOR: Bogdanovich, M. M., Cand. of Tech. Science, Docent; Ed. In-Chief; Bol'shakov, S. A.; Ed. of Pub. House: Borodulina, I. A.; Tech. Ed.: Sokolova, L. B.

PURPOSE: This collection is intended for engineer, technical and scientific personnel working in the field of instrument manufacturing. It may also be useful to students engaged in instrument-manufacturing studies at institutions of higher education.

Theory and Design of Instrument-components in Precision Mechanics (Cont.)

COVERAGE:

The following; subjects are discussed: theory and precision of clock mechanisms and design of their component parts, such as conoids and elastic steel-band transmissions; determination of the line of action of forces acting on the specimen in tension and compression tests; screwed connections of machine parts; torque developed in a spherical gyroscope; graphic and analytical method for determining limits of changing of variable vector- components; determination of the relative position of links in three-dimensional link mechanisms.

8. Aksel'rod, Z. M., Candidate of Technical Sciences, Docent. Theoretical and Experimental Investigation of Clock Mechanisms With Forced Movement and Small Oscillation Period of the Balance Wheel 106
   The author derives and analyses the principle equations for determing the effect of actuating moment on the period and amplitude of balance wheel in clock mechanisms.

9. Aksel'rod, Z. M. Stablization of the Oscillation Period of a Balance Wheel Connected with the Movement Mechanism by Means of a Hair Spring Having a Non-linear Restoring Moment 127
   The author discusses the effect of non-linearity of the hair spring restoring moment on the characteristics of a regulating mechanism equipped with free movement of the tie bar.

10. Aksel'rod, Z. M. Chronometer Impulse Stabilizers 154
    The author points out imperfections of existing mechanical chronometers and discusses some more accurate types.

AVAILABLE: Library of Congress

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GO/gmp
May 21,1958

124-58-6-6338

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 6, p 8 (USSR)

AUTHOR: Aksel'rod, Z. M.

TITLE: A Study of Continuous-rotation Speed Regulators (Issledovaniye regulyatorov skorosti nepreryvnogo vrashcheniya)

PERIODICAL: V sb.: Tekhnol. priborostroyeniya. Moscow-Leningrad, Mashgiz, 1957, pp 81-100

ABSTRACT: A study was made of the movements of high-precision mechanical speed regulators. The effect of the parameters of a regulator on the precision of its operation was investigated, and methods are recommended for the selection of optimal parameters which will attain greater precision. It is proposed that the regulators have a differential gear with a correction system.

G. M. Glanov

1. Speed regulators--Analysis

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SOV/123-59-15-60148

Translation from: Referativnyy zhurnal. Mashinostroyeniye, 1959, Nr 15, p 178 (USSR)

AUTHOR: Aksel'rod, Z.M.

TITLE: Theoretical and Experimental Investigations of Watch Mechanisms With a Restricted Run With a low Oscillation Period of the Balance

PERIODICAL: V sb.: Teoriya i raschet elementov priborov tochnoy mekhaniki. Moscow - Leningrad, Mashgiz, 1957, pp 106 - 126

ABSTRACT: The starting regulators of watch mechanisms are investigated, which are destined for the measurement of small time intervals. The magnitude of the oscillation period of the balance reaches up to 0.003 sec. In such mechanisms the moment of inertia J is, at low oscillation periods T of the balance, very small, while the rigidity of the hair spring, with only a small number of turns, is considerable. The differential equation of the balance run for the half period is examined. When calculating the equation it is assumed that the torque of the hair spring is in proportion to the deflection angle of the balance, that there is a constant friction in the system and that this friction is in proportion to the square of the angular velocity of the balance, and that the moment of resistance of the

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SOV/123-59-15-60148

heoretical and Experimental Investigations of Watch Mechanisms With a Restricted Run
With a low Oscillation Period of the Balance

gearing, reduced to the axis of the driving wheel, is proportional to the square of the angular velocity of the latter. The momention curves are approximated by the polynomial of the first degree with respect to the deflection angle of the balance φ. The coefficient of the polynomial is determined by the method of square approximation. The rating of errors is stated, which are taking place when the natural exponential function is replaced by the first three terms of the expansion; at an amplitude of $\Phi = 72^{\circ}30'$ this error does not exceed 0.3%. The oscillation period of the balance is determined by summing up the time periods in which the balance passes every section of the oscillation process, clockwise and counterclockwise. The analysis of the obtained equations for the restricted cylinder-type run is given. At low amplitudes the oscillation period of the balance first decreases comparatively fast, reaches the minimum value and, at a further increase in the amplitudes of oscillation, it grows comparatively fast. At high and low amplitudes a strong non-isochronism of oscillations takes place. Therefore the indicating accuracy of watches with a restricted run depends on the used range of the working amplitudes. Based on the equations obtained the phase diagrams of the balance with a restricted run were plotted. By tests the author established that the smallest oscillation periods can be obtained by reducing the angle of contact in the run down to half the

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Theoretical and Experimental Investigations of Watch Mechanisms With a Restricted Run With a low Oscillation Period of the Balance

pitch of the drive wheel, i.e. at a conjugation of the balance with a cylinder type run. Such a run is distinguished by a comparatively great stability, which can be increased by a reduction of the opening (aperture) in the cylinder. The smallest period obtained at the pilot installation amounted to approximately 0.0026 sec. The results of the tests for a reduction of the oscillation period by replacing the hair springs showed that it is necessary, when using a more rigid hair spring, to increase the moment of the drive considerably in order to keep the amplitude of oscillation constant. The necessity of designing a drive with a considerable moment is one of the main reasons limiting the possibility of obtaining small oscillation periods. A considerable reduction of the oscillation period (from 0.03 to 0.0026 sec) on account of a decrease in the moment of inertia of the balance permits to construct a watch mechanism with a wide speed range of the receiving axis, but with an increase in the coefficient of nonuniformity of the regulator and, consequently, with a reduced accuracy of the watch run.

K.A.M.

SOV/123-59-16-64896

Translation from: Referativnyy zhurnal. Mashinostroyeniye, 1959, Nr 16, p 173 (USSR)

AUTHOR: Aksel'rod, Z.M.

TITLE: Stabilizing the Oscillation Period of the Balance Connected to the Running Gear With the Aid of a Hair Spring With a Nonlinear Restoring Moment

PERIODICAL: V sb.: Teoriya i raschet elementov priborov tochnoy mekhaniki. M.-L., Mashgiz, 1957, 127 - 153

ABSTRACT: The effects of the nonlinearity of the restoring moment of the hair spring (spiral) of a watch balance, connected with the running gear, on the dynamic characteristics of the starting regulator (dependence of oscillation period on its amplitude) are investigated. The possibilities of a reciprocal compensation of the effects of the running gear and of the nonlinearity of the spiral on the period of oscillation at certain values and signs of the nonlinearity coefficient are studied. It is suggested to solve the differential equation of the balance motion by the method of adjusting the initial conditions by sections of the oscillation process. In this way the restoring moment of the hair spring is expressed approximately by the odd polynomial of the third degree $M = k(\varphi + \varepsilon\varphi^3)$

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Stabilizing the Oscillation Period of the Balance Connected to the Running Gear With the Aid of a Hair Spring With a Nonlinear Restoring Moment.

but for the sections of angles of momentum and release by the linear relation $M = k\varphi$. The period of oscillation of the balance is represented by the sum of the times the balance requires to cover the individual sections. An expression is derived connecting the amplitude of oscillation with the torque at the driving wheel. According to the formulae obtained (based on the example of the starting regulator of the "Zarya" watch) the dynamic characteristics of the regulator for three values of the nonlinearity coefficient are determined. It is mentioned that in the case of $\varepsilon < 0$ (elastic soft spiral) it is possible to obtain such a section of characteristics in which the period of oscillation changes only insignificantly; thereby the compensation of the effects of the running gear on the period of oscillation is effected. The solution of the differential equation of the balance motion by the method of approximation (asymptotic method) by N.M. Krylov and N.N. Bogolyubov is also given. For the calculation of the effects of the running gear formulae are used which were obtained earlier by the method of adjustment (if $\varepsilon = 0$). By summing the curves characterizing the effects of the nonlinearity of the hair spring on the effects of the running gear, the author points out that, at certain values of the nonlinearity coefficient ε and ε_1 it is possible to obtain the compensation of the effects of the running gear on the period of

Stabilizing the Oscillation Period of the Balance Connected to the Running Gear With the Aid of a Hair Spring With a Nonlinear Restoring Moment

oscillation. It is stated that the characteristics of the hair spring, which permit the compensation of the effects of the running gear, can be obtained both by the aid of the hair springs, the modulus of elasticity of which depends on the amplitude of oscillation, and by using the interaction between the hair spring and the pins of the dial. Three examples of the position of the hair spring in the dial pins are investigated. 5 references.

K.A.M.

AKSEL'ROD, Z.M., kandidat tekhnicheskikh nauk.

[redacted]igating the dynamics of escapement regulators with potential drives. Priborostroenie no.7:14-17 Jl '57. (MLRA 10:9)
(Clocks and watches--Escapements)

AKSEL'ROD, Z.M., kand. tekhn. nauk, dots.

Theoretical and experimental investigation of watch mechanisms having bound movement and very short period of balance wheel oscillations. Sbor. st. LITO no.22:106-126 '57. (MIRA 11:2)
(Clocks and watches--Repairing and adjusting)

AKHEL'ROD, Z.M., kand. tekhn.nauk, dots.

Stabilizing the oscillation period of balance wheels connected with movement by hair springs having nonlinear re-establishing moments. Sbor. st. LITO no.22:127-153 '57. (MIRA 11:2)
(Clocks and watches--Repairing and adjusting)

AKSEL'ROD, Z.M., kand. tekhn. nauk, dots.

Pulse stabilizers used in chronometers. Sbor. st. LITO no.22:154-167 '57. (MIRA 11:2)
(Chronometer)

124-58-9-9513

Translation from: Referativnyy zhurnal, Mekhanika, 1958, Nr 9, p 9 (USSR)

AUTHOR: Aksel'rod, Z. M.

TITLE: Investigation of the Dynamics of a Speed Governor With Alternating Motion (Issledovaniye dinamiki regulyatora s vozvratnym khodom)

PERIODICAL: Sb. nauchn. tr. kafedr matem., mekhan., khimii. Leningr. in-t tochnoy mekhan. i optiki, 1957, Nr 24, pp 45-70

ABSTRACT: An escapement-type speed governor with alternating motion, in which the escape wheel and the anchor are kinematically connected over a significant part of the amplitude of the oscillations of the balance and in which the moment of inertia of the balance is greater than the moment of inertia of the escape wheel, is considered as a nonlinear system with one degree of freedom with due consideration of the profiles of the pallet, the friction between a tooth of the escape wheel and a pallet, the impact of a tooth against a pallet and the additional angles of rotation of the balance following an impact. The impulse moment and the reduced moment of inertia of the balance are assumed as linear functions of the angular position of the balance. The periodic

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124-58-9-9513

Investigation of the Dynamics of a Speed Governor With Alternating Motion (cont.)

motion of the governor and its stability are to be found. It is stated that in an earlier work of the same author [Regulyatory skorosti v priborostroyenii (Speed Governors in Instrument Making). Moscow, Mashgiz, 1949] the derivation of the possible instability of the operation of such a governor was erroneous.

A. S. Alekseyev

1. Dynamics 2. Speed regulators--Mathematical analysis 3. Speed regulators --Motion 4. Speed regulators--Stability 5. Mechanics--Theory

Card 2/2

AKSEL'ROD, Z.M., kand.tekhn.nauk

Investigating the dynamics of escapement with new type chronometer movement. Izv.vys.ucheb.zav.; prib. no.3:84-94 '58.
(MIRA 12:2)

1. Leningradskiy institut tonkoy mekhaniki i optiki.
(Clocks and watches—Escapement)

SOV/159-58-3-26/31

24(4)
AUTHOR: Aksel'rod, Z.M.

TITLE: An Investigation of the Influence of the Rotation of an Object on a Frictional Rest Escapement

PERIODICAL: Nauchnyye doklady vysshey shkoly, Mashinostroyeniye i priborostroyeniye, 1958, Nr 3, pp 185-189 (USSR)

ABSTRACT: Clock mechanisms with anchor escapements and balances are installed on rotating objects in a number of branches of contemporary engineering. Therefore, the author studied the influence of external forces, arising during the rotation of the object, on the escapement. He obtained formulae for determining the parameters and operating conditions of the escapement. These parameters provide a high accuracy of the clock movement within a wide range of angular velocity changes of the object. He presents a differential equation of the self-oscillatory motion of the balance using the approximation method of N.M. Krylov and N.N. Bogolyubov. Figure 2 shows the dependence of $\Delta T/T$ on the

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An Investigation of the Influence of the Rotation of an Object on a Frictional Rest Escapement

angular velocity of the object. Figure 3 shows the dependence of the oscillation amplitude of the balance on the angular velocity of the object. There are 3 graphs, 1 diagram and 3 Soviet references.
This article was presented by the
Leningradskiy institut tochnoy mekhaniki i optiki
(Leningrad Institute of Precision Mechanics and Optics)

SUBMITTED: March 27, 1958

S/124/60/000/004/005/027
A005/A001

Translation from: Referativnyy zhurnal, Mekhanika, 1960, No. 4, p. 21, # 4340

AUTHOR: Aksel'rod, Z.M.

TITLE: Investigations of the Dynamics of Starting Governors Having Impulse Stabilizers

PERIODICAL: Nauchn. tr. Leningr. in-t tochnoy mekhan. i optiki, 1958, No. 32, pp. 40-58

TEXT: Certain impulse stabilizer variants for small-dimension time keepers are described. Formulae are given (without proof) correlating the relative increase in the balance oscillation period with the design parameters of lever watches without impulse stabilizer and for the same watches supplied with an impulse stabilizer. A comparison of the dynamical characteristics is carried out for numerical parameter values.

N.N. Bautin

Translator's note: This is the full translation of the original Russian abstract.

Card 1/1

AKSEL'ROD, Z.M., kand.tekhn.nauk, dots.

Investigating the occurence of stopping of the natural vibration movement in watches. Izv.vys.ucheb.zav.; prib. no.1:81-87 '59. (MIRA 12:11)

1. Leningradskiy institut tochnoy mekhaniki i optiki.
(Clocks and watches—Testing)

24(3)
AUTHOR: Aksel'rod, Z.M., Candidate of Technical Sciences

SOV/146-59-2-15/23

TITLE: Research of Clock Dynamics by Method of Slow Changing Coefficients

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy - priborostroyeniye, 1959, Nr 2, pp 92-102 (USSR)

ABSTRACT: This article deals with the approximate method of slow changing coefficients for research of clock balance oscillating movement under action of external forces. This method developed by the Soviet scientists is used for determining the influence of unbalance and non-linearity of the hair spring restoring moment on the balance oscillating movement. For determining the moving node influence on the period and amplitude, the method of linear approximation is applied. The author analyzes a clock of free-lever type (Fig 1). Having established dependence between the angular velocity of the object on which the clock is mounted and the balance oscillation period value, on the one hand, and between the period

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and the amplitude, on the other hand, the author draws the following conclusion: The above-mentioned method enables solving a definite number of problems pertaining to the theory of clocks. It is applicable also in those cases where the oscillating system is near to the system used in common pocket- and wrist watches. This method permits receiving of simple and clear formulae for studying the influence of certain slight non-linearities on the balance oscillating movement. The possibility of decreasing the influence of external forces on the period and oscillation amplitude of the balance by means of alteration of the oscillating system parameters is established. It has been demonstrated that when the object's angular velocity and, consequently, the centrifugal force are increased, the clock accuracy is diminished and the balance oscillation amplitude is decreased. Recommended by the Kafedra priborov vremeni (Chair of Time-Meters).

Research of Clock Dynamics by Method of Slow Changing Coefficients SOV/146-59-2-15/23

There are 3 tables, 2 diagrams, and 7 Soviet references.

ASSOCIATION: Leningradskiy institut tochnoy mekhaniki i optiki (Leningrad Institute of Precision Mechanics and Optics)

SUBMITTED: January 27, 1959

Card 3/3

AKSEL'ROD, Z.M., dotsent, kand.tekhn.nauk

Investigating the effect of a centrifugal overload on the trigger regulator with a free anchor movement. Izv.vys.ucheb. zav.; prib. no.3:72-86 '59. (MIRA 13:4)

1. Leningradskiy institut tochnoy mekhaniki i optiki. Rekomendovana kafedroy priborov vremeni.
(Clocks and watches--Escapements)

SOV/146-2-4-14/19

AUTHOR: Aksel'rod, Z.M., Candidate of Technical Sciences, ~~Docent~~

TITLE: Experimental Investigation Into the Effect of Centrifugal Overload on the Accuracy of Watches

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy. Priborostroyeniye. 1959, Nr 4, pp 106-119 (USSR)

ABSTRACT: Information is given on a laboratory test installation and a method of experimental study of watches. The installation and its photo-electric pickup are shown in a diagram and a photograph (Figures 1, 2). The test installation platform can be rotated at 50 to 800 r.p.m.; the maximum centrifugal overload is 110 g; the d.c. motor driving power is 0.5 kw; the installation uses a "FS-A4" photoresistance and a "SM-30" illuminating lamp. The information includes

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Experimental Investigation Into the Effect of Centrifugal Overload on the Accuracy of Watches

test results for a watch of the Pervyy moskovskiy chasovoy zavod (The First Moscow Watch Plant). The following conclusions are made: the dynamic characteristics of the watch at centrifugal overloads depend on 1) the amplitude curve of the watch performance, 2) the direction of the centrifugal forces with respect to the working parts of the working node and unbalanced lever (Figures 5a and 6), 3) the intensity of the friction increase in the directional lever axes, and 4) on the changing character of the hair-spring recovery moment when the centrifugal overload is increased. The smaller the lever weight, the smaller is the centrifugal overload effect on the lever oscillation period; the higher the kinetic energy of the lever, the smaller is the centrifugal overload

Experimental Investigation Into the Effect of Centrifugal Overload on the Accuracy of Watches

effect on the lever's oscillation period and the accuracy of the watch higher. The experimental results accord well with those obtained theoretically /Reference 3_7. This article was recommended by the Kafedra priborov vremeni (The Chair of Time Instruments). There are 2 photographs, 2 diagrams, 2 tables, 3 sets of graphs, 2 graphs, and 3 Soviet references.

ASSOCIATION: Leningradskiy institut tochnoy mekhaniki i optiki (The Leningrad Institute of Precision Mechanics and Optics)

SUBMITTED: June 22, 1959

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SOV/146-2-5-13/19

24(6)

AUTHOR: Aksel'rod, Z.M., Candidate of Technical Sciences, Docent

TITLE: An Experimental Investigation Into the Effect of Vibration on Clockwork Action

PERIODICAL: Izvestiya vysshikh uchebnykh zavedeniy, Priborostroyeniye, 1959, Nr 5, pp 80 - 90 (USSR)

ABSTRACT: Information is given on an experimental investigation into the effect of vibration on clockwork action. The test installation is illustrated by diagram (Figure 1) and photograph (Figure 2a). Engineer S.K. Starshinov developed a device (Figure 2b) for studying the effects of vibration on the free damped oscillations of the balance. Characteristics and basic components of the installation are as follows: a "P-12" recording device which prints the watch's performance on a moving tape; a "VS-68" vibration stand with a

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An Experimental Investigation Into the Effect of Vibration on Clockwork Action

vertical table-vibration amplitude of 0.1 to 5 mm; a maximum vibration acceleration of 25 g; the capacity to test objects of up to 15 kg; an oscillation frequency of 5 to 80 cycles; an "FS-A4" photo-resistance; an "SM30" illuminating lamp; a feed voltage of 26 volts. Tests with a watch having a relatively high balance disequilibrium showed that vibration generates a positional error far higher than that in a watch not subject to vibrations. By increasing the balance oscillation amplitude, it is possible to reduce the positional error. The results obtained can be used for improving or developing vibration-proof watches. This article was recommended by the Kafedra priborov vremeni (The Chair of Time Instruments). There are 1 photograph, 2 diagrams, 7 graphs, 2 tables, and 2 Soviet references.

AKSEL'ROD, Z. M.

Doc Tech Sci - (diss) "Dynamics of drain regulators of velocity." Leningrad, 1961. 27 pp; (Ministry of Higher and Secondary Specialist Education RSFSR, Leningrad Polytechnic Inst imeni M. I. Kalinin); 150 copies; price not given; list of author's works on pp 26-27 (24 entries); (KL, 5-61 sup, 186)

AKSEL'ROD, Z.M.

Stabilizing natural-vibration period of the balance in an escapement having a new-ty;e nonfree movement. Izv.vys.ucheb. zav.; prib. 4 no.3:83-94 '61. (MIRA 14:6)

1. Leningradskiy institut tochnoy mekhaniki i optiki. Rekomendovana kafedroy priborov vremeni.
(Clocks and watches--Escapements)

AKSEL'ROD, Z.M.

Analysis of the performance of an electric winding mechanism.
Izv.vys.ucheb.zav.; prib. 5 no.5:90-97 '62. (MIRA 15:9)

1. Leningradskiy institut tochnoy mekhaniki i optiki.
Rekomendovana kafedroy priborov vremeni.
(Clocks and watches) (Electric controllers)

AKSEL'ROD, Z. M.

Investigating the dynamics of miniature electric clocks. Izv. vys. ucheb. zav.; prib. 6 no.2:78-88 '63.
(MIRA 16:4)

1. Leningradskiy institut tochnoy mekhaniki i optiki. Rekomendovana kafedroy priborov vremeni.

(Clocks, Electric)

AKSEL'ROD, Z.M.

Investigation of an electromechanical escapement with a potential drive. Izv.vys.ucheb.zav.; prib. 6 no.3:96-106 '63. (MIRA 16:9)

1. Leningradskiy institut tochnoy mekhaniki i optiki. Rekomendovana kafedroy vremeni.

AKSEL'ROD, Z.M.

Using watch regulators as frequency transducers of slowly changing linear accelerations. Izv.vys.ucheb.zav.; prib. 6 no.6:93-103 '63. (MIRA 17:3)

1. Leningradskiy institut tochnoy mekhaniki i optiki. Rekomendovana kafedroy priborov vremeni.

AKSEL'ROD, Z.M.

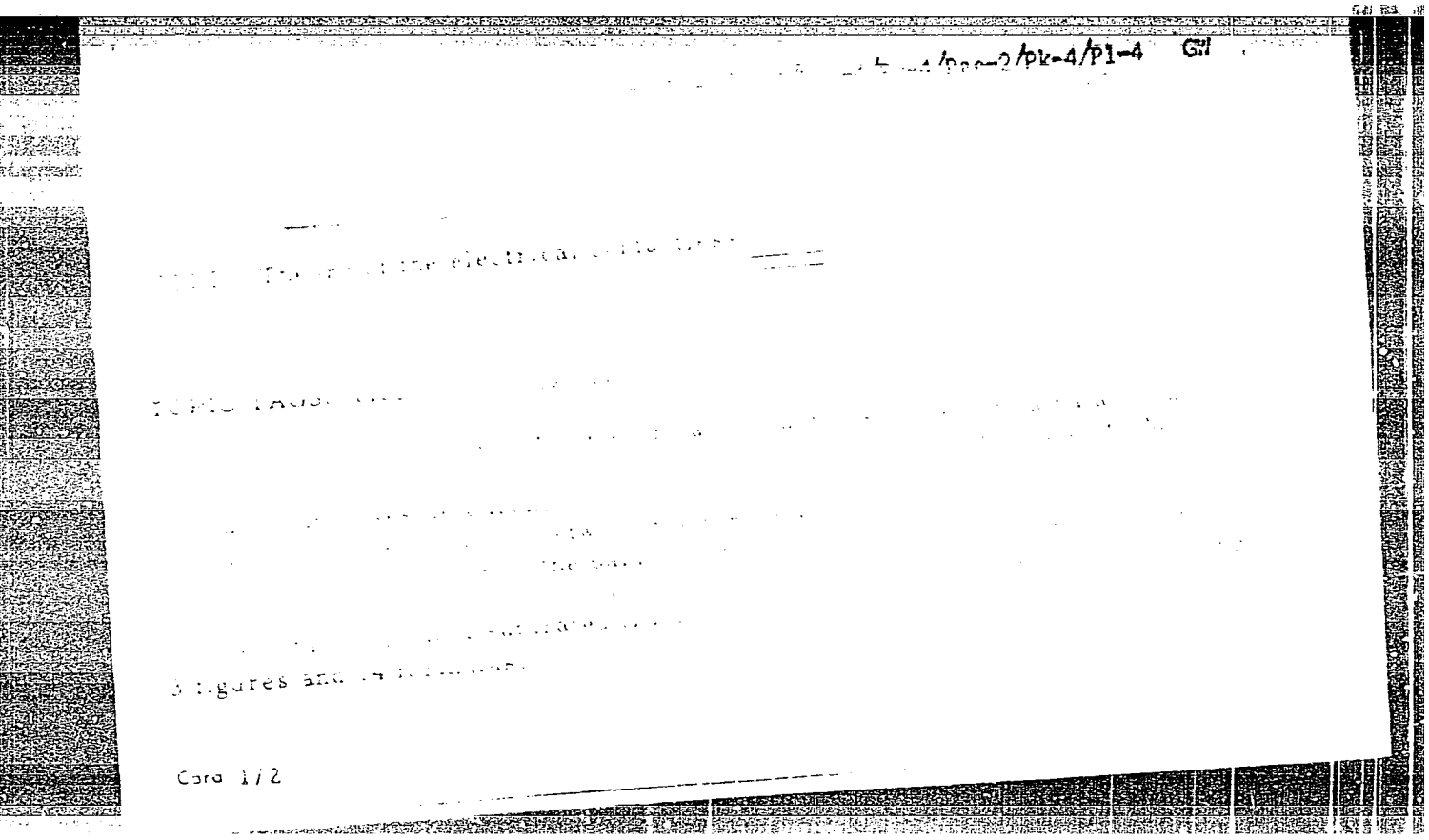
Investigating small electric clocks with an indirect-action electric drive. Izv.vys.ucheb.zav.; prib. 7 no.2:133-141 '64. (MIRA 18:4)

1. Leningradskiy institut tochnoy mekhaniki i optiki. Rekomendovana kafedroy priborov vremeni.

AKSEL'ROD, Z.M.

Theory of electric noncontact clocks. Izv.vys.ucheb.zav.; prib. 8 no.1:143-150 '65. (MIRA 18:3)

1. Leningradskiy institut tochnoy mekhaniki i optiki. Rekomendovana kafedroy priborov vremeni.



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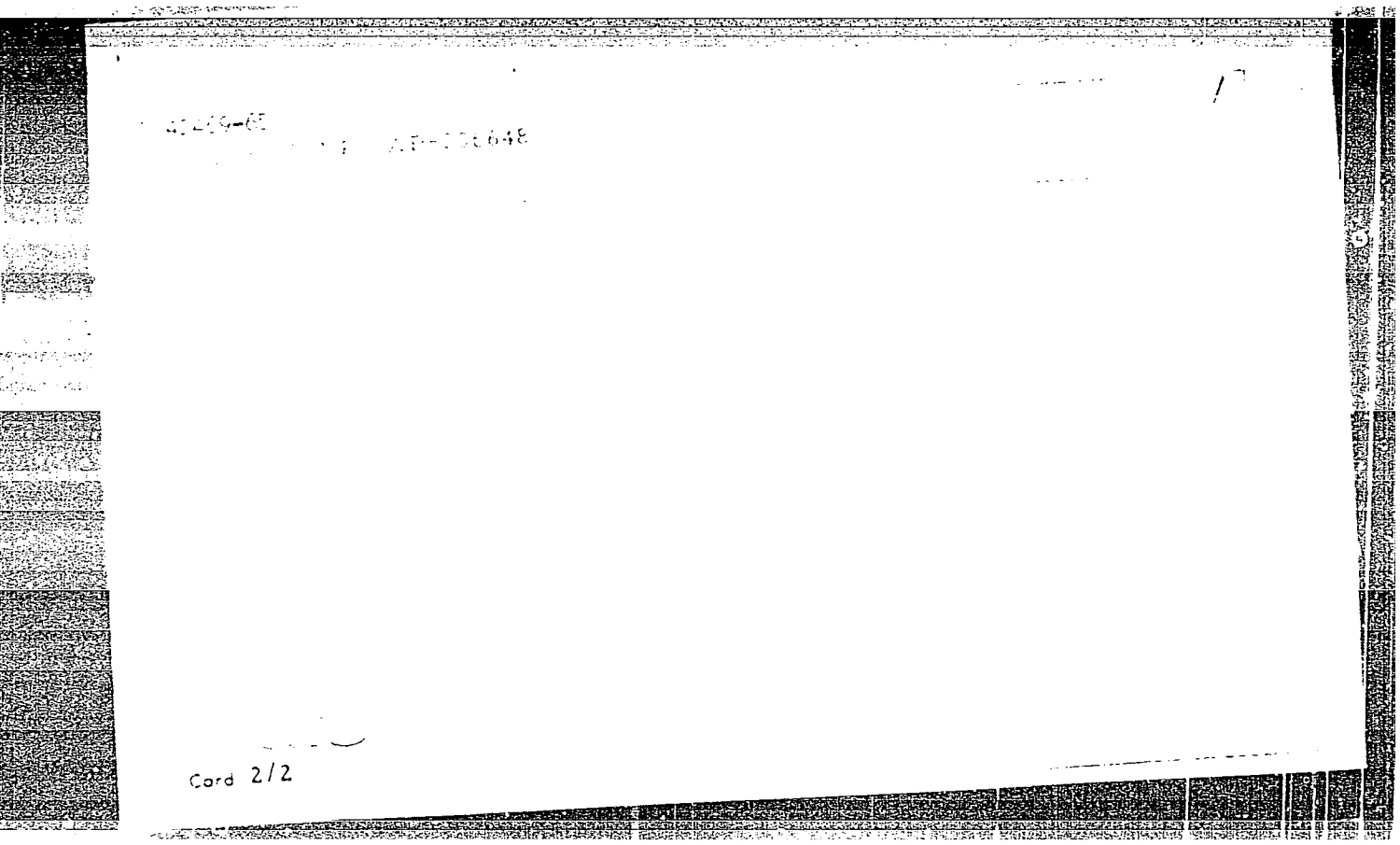
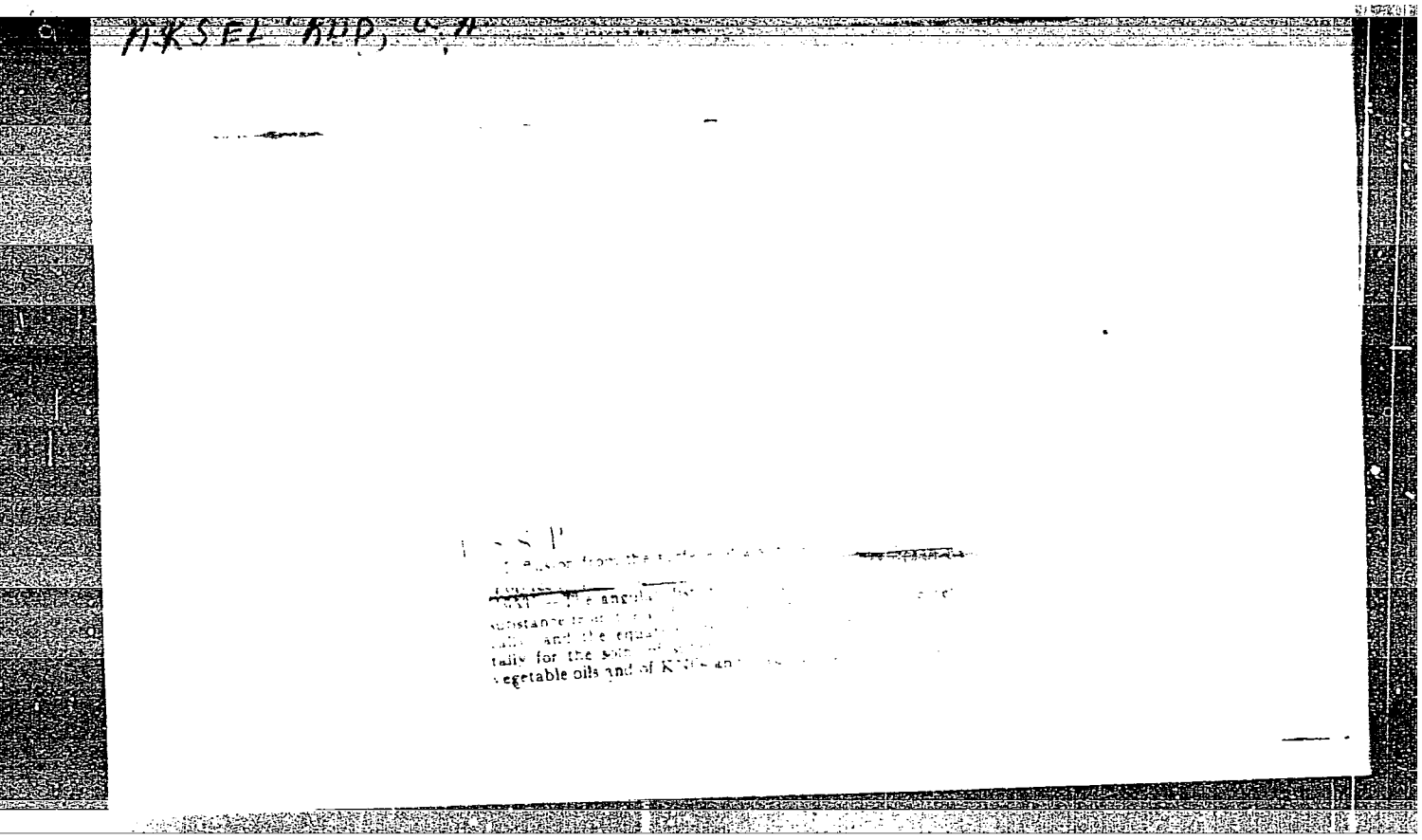


Card 2/2



AKSEL'RUD, G. A.

The kinetics of the solution of a solid particle in flowing liquid. G. A. Aksel' Rud (Polytech. Inst., Lvov). *Zhur. Fiz. Khim.* 28, 1725-30(1954); cf. *C.A.* 49, 5930*f*.—The various methods for the soln. of solid particles in a liquid current are classified on the basis of kinetic considerations. Equations are derived for calcg. the rate coeff. for soln., and calcd. values are compared with expti. values for NaCl and KCl (Zdanovskii, *C.A.* 48, 4291*c*). J. Rovtar Leach

AKSEL'RUD, G. A.

USSR/Physics - Physical chemistry

Card 1/1 Pub. 147 - 4/27

Authors : Aksel'rud, G. A.

Title : The kinetics of a solution of solid bodies in conditions of natural convection

Periodical : Zhur. fiz. khim. 28/12, 2107-2115, Dec 1954

Abstract : The kinetics of a solution of solid bodies in conditions of natural convection was investigated during motion of the solution in a laminary layer. A theory is presented which may explain the change in the form of the bodies during their solution in a latent liquid. Formulas are given for the calculation of the rate of solution from the surface of the body. The similarity between the solution and heat emission processes during natural convection, which can be utilized for the modeling of heat emission, is discussed. Five USSR references (1931-1953). Graphs; illustrations; diagrams.

Institution : The Polytechnicum, Lvov

Submitted : December 20, 1953

AKSEL'RUD, G. A.

AKSEL'RUD, G. A. - "On the use of hydrodynamics in the kinetics of dissolution of solid particles". L'vov, 1955. Min Higher Education Ukrainian SSR. Donets Order of Labor Red Banner Industrial Inst imeni N. S. Khrushchev. (Dissertation for the Degree of Candidate of Technical Science.)

SO: Knizhnaya Letopis', No. 43, 22 October 1955. Moscow

$ AKSEL'RUD, G. A.

USSR/Processes and Equipment for Chemical Industries - Processes and Apparatus for Chemical Technology, K-1

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 63949

Author: Aksel'rud, G. A.

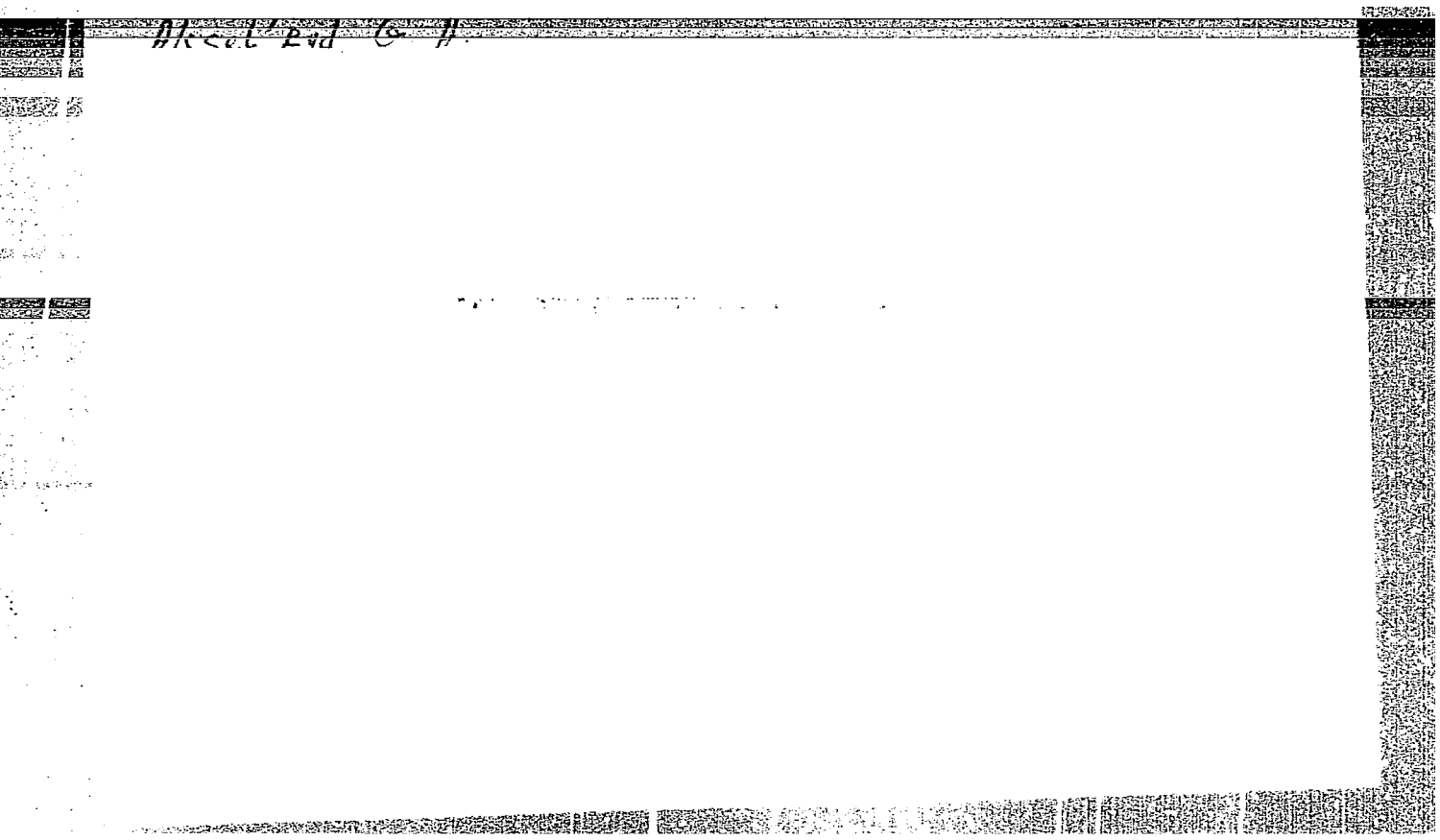
Institution: None

Title: Kinetics of Dissolution of Solid Particles in an Apparatus Equipped with a Stirrer

Original Periodical: Nauch. zap. L'vovsk. politekhn. in-ta, 1955, No 29, 63-80

Abstract: Derived are differential equations that characterize the motion of a solid particle within an apparatus provided with a stirrer; processing of these equations by methods of similarity theory results in determination of similarity criteria. Determined experimentally were several sets of operation conditions of the stirrer equipped apparatus: (1) passive, occurring at low speed of rotation of the stirrer, when the solid particles remain stationary on the bottom of the apparatus; (2) centrifugal, during which the particles are in a

Card 1/2



AKSEL'RUD, Grigoriy Abramovich; VESELOVSKIY, T.M., tekhn. red.

[Theory of the diffusion extraction of substances from porous bodies]Teoriia diffuzionnogo izvlecheniia veshchestv iz poristykh tel. L'vov, L'vovskii politekhn. in-t, 1959. 233 p. (MIRA 15:11)
(Extraction (Chemistry)) (Diffusion) (Porous materials)

05834
SOV/76-33-10-32/45

5(4)
AUTHOR: Aksel'rud, G. A.

TITLE: Theory of the Diffusion Extraction of Substances From Porous Bodies. I. The Equations of Extraction Kinetics

PERIODICAL: Zhurnal fizicheskoy khimii, 1959, Vol 33, Nr 10, pp 2316 - 2324 (USSR)

ABSTRACT: The motion of the substance in extraction may be divided into two stages: 1) transfer of the substance inside the porous body to its surface (internal diffusion); 2) transition from the surface into the bulk of the liquid (external diffusion). Internal diffusion was investigated by P. M. Silin (Ref 1) et al by applying Fick's law, and A. V. Lykov (Refs 2,3) presented a systematic interpretation of the theory of internal diffusion. Progress has also been made in the study of external diffusion thanks to publications by V. G. Levich (Ref 4). This article deals with extraction from a porous body the pores of which are filled with the extraction liquid. The porous bodies are assumed to be monodisperse, homogeneous and isotropic (as regards diffusion of the solute). Differential equations of the material balance and the boundary conditions are deduced for periodic, parallel-flow and counterflow extraction. Integration

Card 1/2

S/076/60/034/01/014/044
B008/B014

5 (4)

AUTHOR: Aksel'rud, G. A.

TITLE: The Theory of Diffusion Extraction of Substances From Porous Bodies. II. Kinetics of Extraction From a Polydisperse Mixture of Porous Particles

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol 34, Nr 1, pp 86-91 (USSR)

ABSTRACT: The author studied the extraction kinetics of spherical particles of various size which form a polydisperse mixture. The weight distribution of the particles with respect to their size was given. The polydisperse mixture is practically always composed of particles the size of which changes on transition from one particle to the other. Such a mixture is characterized by the distribution function L(R). If L(R) is experimentally determined and graphically represented, it is possible to determine the integral $\int_{(R)} E(R,t)L(R)dR$ numerically or graphically for any instant t (R is the particle radius). Direct integration is possible for some distribution func-

Card 1/2

tions. Next, the author derives equations for the extraction kinetics from a polydisperse mixture of particles which are isotropic with respect to diffusion. The application of the results obtained is exemplified. A figure on p 90 illustrates the graphic solution of the characteristic equation. Very accurate values of the roots of the characteristic equation are obtained by the iteration method without any graphical representation. By substitution into equation (5) one obtains the desired kinetic equations. There are 1 figure and 4 Soviet references.

ASSOCIATION: L'vovskiy politekhnicheskiy institut (L'vov Polytechnic Institute)

SUBMITTED: March 31, 1958

S/076/60/034/02/005/044
B010/B015

AUTHOR: Aksel'rud, G. A.

TITLE: Theory of the Diffusion Extraction of Substances From Porous Bodies. III. Kinetic Heterogeneity of the Pores

PERIODICAL: Zhurnal fizicheskoy khimii, 1960, Vol 34, Nr 2, pp 278-286 (USSR)

ABSTRACT: The influence of the structure of porous bodies upon the extraction kinetics is discussed, and the term "kinetic heterogeneity" of the pores as derived by P. G. Romankov and Bao Chzhi-tsyuan' (Ref 1) is pointed out. The existence of two types of porous bodies is assumed. One of them may be represented by particles adhering to one another, is isotropic with respect to diffusion, and has "kinetically homogeneous" pores. The other type is characterized by irregularly distributed pores of different size and shape. A system of ideal pores (cylindrical or spherical) is assumed in order to carry out an analytical investigation of the last-mentioned type of pores. For the case of an extraction with large quantities of liquid (of the concentration c_1) equations of extraction kinetics are derived. If c_1 = const. during the extraction, an idea of the porous structure may be obtained from the curves of extraction kinetics (from the viewpoint of trans-

Card 1/2

AKSEL'RUD, G.A.

Theory of the diffucion extraction of substances from porous bodies. Part 3: Kinetic nonequivalence of the pores. (MIRA 14:7)
Zhur. fiz. khim. 34 no.2:278-286 F '60.

1. L'vovskiy politekhnicheskiy institut.
(Diffusion) (Extraction (Chemistry))

AKSEL'RUD, G. A.

"Heat and Mass Transfer Transformations in Porus Solid-liquid Systems."

Report submitted for the Conference on Heat and Mass Transfer, Minsk, BSSR, June 1961.

AKSEL'RUD, G.A.

Transformations of processes of the diffusion extraction of the solid phase. Zhur.fiz.khim. 35 no.12:2766-2769 D '61. (MIRA 14:12)

1. L'vovskiy politekhnicheskiy institut.
(Extraction (Chemistry))

AKSEL'ROD, G.A.

New method in the theory of experiment. Dokl. LPI 5 no. 1/2: 100-103 '63. (MIRA 17:6)

FIKLISTOV, I.N.; AKSEL'RUD, G.A.

Kinetics of mass transfer in a vibrating movement of a solid in a liquid. Dokl. LPI 5 no. 1 2:104-108 '63. (MIRA 17:6)

AKSEL'RUD, G.A.; SEMENISHIN, Ye.M.

Kinetics of extraction from a bed of a polydispersed mixture.
Dokl. LPI 5 no. 1/2:148-155 '63. (MIRA 17:6)

AKSEL'RUD, G.A.

Kinetics of sorption from solutions. Zhur. fiz. khim. 37 no.6: 1251-1257 Je '63. (MIRA 16:7)

1. L'vovskiy politekhnicheskiy institut.
(Sorption)

FIKLISTOV, I.N.; AKSEL'RUD, G.A.

Kinetics of mass transfer with oscillatory motion of a solid body in a fluid flow. Inzh.-fiz. zhur. 7 no.1:45-48 Ja '64. (MIRA 17:2)

1. Politekhnicheskiy institut, L'vov.

AKSEL'RUD, G.A.; POKHODENKO, L.A.

Kinetics of the extraction of a solid from a single capillary. Zhur. fiz. khim. 38:2971-2974 D '64.

(MIRA 18:2)

1. L'vovskiy politekhnicheskiy institut.

AKSEL'RUD, G.A.; SEMENISHIN, Ye.M.

Kinetics of the dissolution of a bed situated in a solid porous medium. Inzh.-fiz. zhur. 10 no.1:41-45 Ja '66.

(MIRA 19:2)

1. Politekhnicheskiy institut, L'vov. Submitted November 27, 1964.

L 05419-67 EWT (1) WW

ACC NR: AP6024640 SOURCE CODE: UR/0170/66/011/001/0093/0098

AUTHOR: Aksel'rud, G. A.

24
B

ORG: Polytechnical Institute, L'vov (Politekhnicheskiy institut)

TITLE: The solution of the generalized problem of heat and mass exchange in a layer

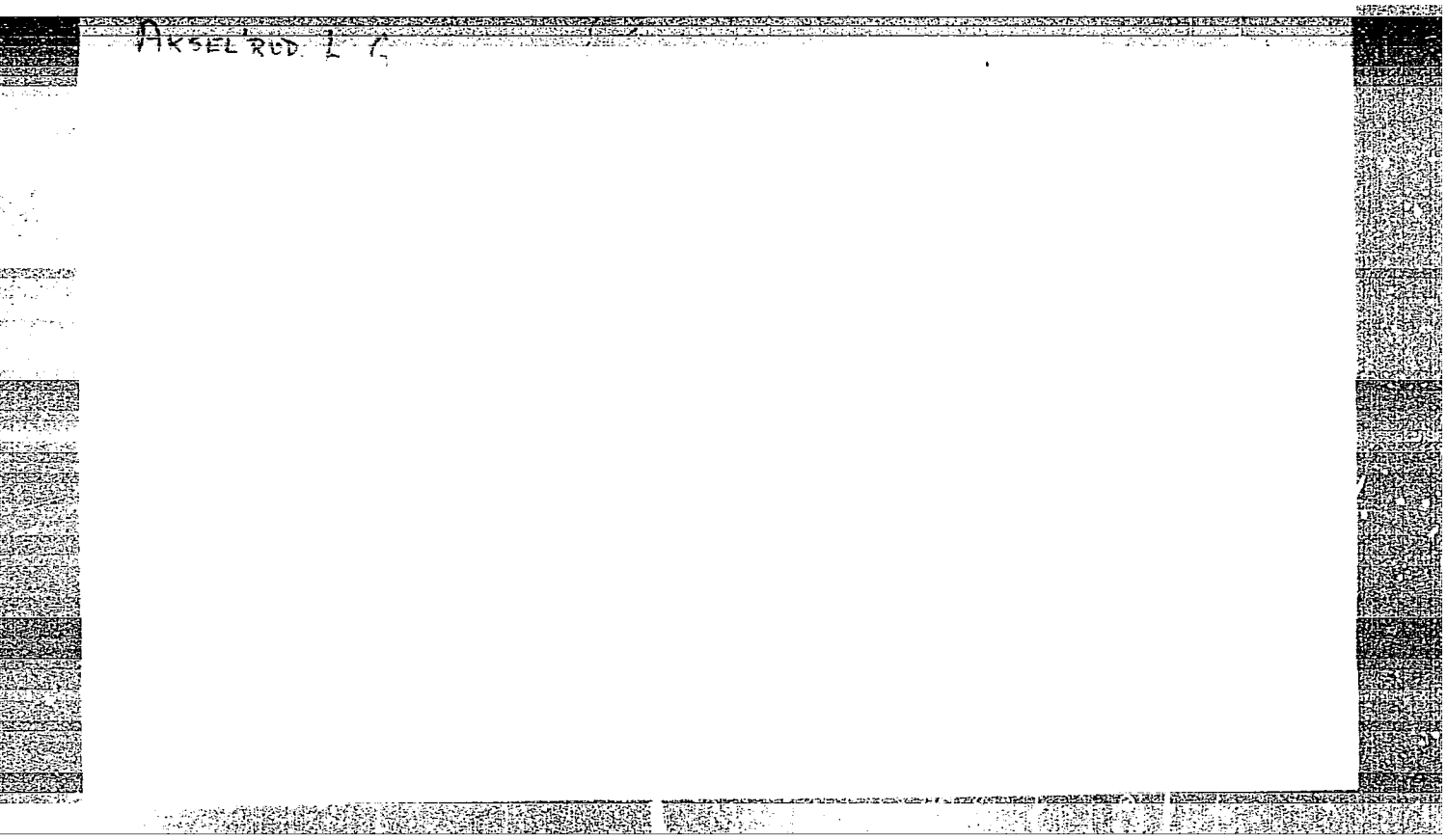
SOURCE: Inzhenerno-fizicheskiy zhurnal, v. 11, no. 1, 1966, 93-98

TOPIC TAGS: heat exchange, mass exchange, gas diffusion, fluid diffusion

ABSTRACT: The kinetics of unrelated heat and mass transfer during fluid or gas motion through a layer is investigated. Theoretical derivations take into account external as well as internal heat and mass transfer. Solutions are presented for layers of differing shape (infinite plate, infinite cylinder, sphere). The basic exact solution is also transformed into approximate simpler expressions valid for restricted ranges of pertinent parameters of the process. Orig. art. has: 3 figures.

SUB CODE: 20/ SUBM DATE: 06Sep65/ ORIG REF: 003/ OTH REF: 006

Card 1/1 UDC: 536.24



AKSELRUD, L.G.

137-58-1-655

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 1, p 102 (USSR)

AUTHOR: Aksel'rud, L. G.

TITLE: Modern Soaking Equipment in Rolling Shops (Pits and Furnaces) (Sovremennyye nagrevatel'nyye ustroystva v prokatnykh tsekhakh (kolodtsy i pechi))

PERIODICAL: Tr. Nauchno-tekhn. o-va chernoy metallurgii, 1956, Vol 10, pp 98-117

ABSTRACT: An examination is made of the special features, the capacity, the utilization of the heat of waste gases, the control and automatic regulation, the heating capacity, the speed of heating, the productivity, the unit consumption of fuel and refractories, the methods of slag removal, and the planning of soaking-pit departments of the types now in widest use: a) multiple-ingot-coverage regenerative soaking pit, b) recuperative bottom center-fired soaking pits, c) recuperative two-way top-fired pits. The characteristics of 2- and 3-zone holding furnaces are also presented. The data on pit and furnace operation are used to draw recommendations as to the trends to be followed in further improvement in their productivity.

V.D.

Card 1/1

1. Furnaces--Characteristics 2. Furnaces--Automation
3. Furnaces--Operation

AKSEL'RUD, L. G.

AKSEL'RUD, L.G., referent; TUMCHAK, V.F.

Soaking pits at the Abbey Works (from "Journal of the Iron and Steel Institute" no. 1, 1956, "Iron and Steel Engineer" no.11, 1953). Stal' 16 no.10:948-949 O '56. (MIRA 10:9)
(Great Britain--Rolling mills)

SOV/133-58-8-23/30

AUTHORS: Kaplan, V.G., Gekhtman, S.D., Aksel'rud, L.G. and Stukalov, M.I., Engineers

TITLE: Modernisation of the Recuperative Soaking Pits with a Central Burner (Modernizatsiya rekuperativnykh nagrevatel'nykh kolodtsev s tsentral'noy gorelkoy)

PERIODICAL: Stal', 1958, Nr 8, pp 747 - 751 (USSR)

ABSTRACT: The modified design and operation of a new group of soaking pits (2 pits) erected in 1954 on the Azovstal' Works are described and illustrated. Main feature: an increase in the heating surface of ceramic recuperators (a 36% increase) and the erection of metallic recuperators for pre-heating of gas (from seamless tubes). This increased the throughput and decreased fuel consumption, as well as permitted the use of blast-furnace gas alone for the heating, but with a decreased throughput, and

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Modernisation of the Recuperative Soaking Pits with a Central Burner

increased fuel consumption.
There are 6 figures and 2 tables.

ASSOCIATIONS: Tsentroenergochermet, Stal'proyekt and Zavod "Azovstal'" ("Azovstal'" Works)

1. Steel--Production 2. Industrial production--Equipment
3. Fuels--Performance 4. Ceramic materials--Applications

Card 2/2

AKSEL'RUD, L.G.; GLINKOV, M.A.; GRIGOR'YEV, V.N.; LIFSHITS, A.Ye.; MANTSEV, R.M.

Prospects for improvements in the design of heating and heat-treating furnaces. Stal' 20 no.6:562-567 Je '60. (MIRA 14:2)
(Furnaces, Heating) (Furnaces, Heat-treating)

AKSEL'RUD, Lev Gershevich; SUKHOV, Ivan Ivanovich; TYMCHAK, Vyacheslav Mikhaylovich; GOLYATKINA, A.G., red. izd-va; MIKHAYLOVA, V.V., tekhn. red.

[Soaking pits]Nagrevatel'nye kolodtsy. Moskva, Metallurgizdat, 1962. 235 p. (MIRA 15:12)
(Furnaces, Heating)

AKSEL'RUD, L.G.; SUKHOV, I.I.; TYMCHAK, V.M.

Recuperative and regenerative soaking pits. Stal' 24 no.12:1143-1144 D '64. (MIRA 18:2)

1. Gosudarstvennyy soyuznyy institut po proyektirovaniyu agregatov staleliteynogo i prokatnogo proizvodstva dlya chernoy metallurgii.

AKSELROD, N. V. (DECEASED) 1963/2

c' 1963

CHEMISTRY

see ILC

8(6) SOV/112-59-3-4485

Translation from: Referativnyy zhurnal. Elektrotekhnika, 1959, Nr 3, p 29 (USSR)

AUTHOR: Aksel'rud, R. N.

TITLE: Water Conditions in the Once-Through Separator-Type Boilers (O vodnom rezhime pryamotochnykh separatornykh kotlov)

PERIODICAL: V sb.: Vnutrikotlovyye fiz.-khim. protsessy, vodopodgotovka i vodn. rezhimy kotlov na elektrost. vysokikh i sverkhvysokikh parametrov. M., AS USSR, 1957, pp 206-213

ABSTRACT: The construction and results of adjustment of water conditions in the separator-type once-through Sulzer boilers (50 ton/hr, 80 atm, 500°C) are described. Separators with a continuous water blowdown placed ahead of the intermediate boiler zone, permit longer periods between flushings of boilers and turbines. However, this does not permit any considerable reduction of the requirements to the quality of feed water because a part of feed-water minerals gets into the boiler through injection after passing through the separator. The

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8(6)

SOV/112-59-3-4485

Water Conditions in the Once-Through Separator-Type Boilers

feed water has a salt content of 0.15-0.20 mg/liter despite the fact that the condensers are cooled by sea water (15,000 mg/liter). Good tightness of the condensers (leak 0.001%) is secured by 2-side rolled joints of the tubes. Between 40-70% of salts brought by feed water remained in the boilers, the percentage being dependent on the leak in of the cooling water and the drag-out of concentrate of the evaporators fed by Na-cationed water. Sulfates largely remain in the boiler; chlorides and alkali compounds are entrained by the steam into the turbines. Boiler-water flushings (with deaerated condensate at 105-110°C) are more effective than steam-water in so far as removal of slightly-soluble salts of Ca and Mg is concerned. Readily-soluble salts can be effectively removed by steam-water flushings. It is recommended that both types of flushings be alternated. The best effect of salt removal and separator blowdown is secured at a temperature of about 330-340°C in the first thermostat.

A.P.M.

Card 2/2

AKSEL'RUD, Semen Borisovich; ZNAMENSKIY, V.L., red.izd-va; BYKOVA, V.V., tekhn. red.

[Organization of exploratory drilling crews] Organizatsiia geologorazvedochnykh burovykh partii. Moskva, Gosgeoltekhizdat, 1963. 83 p. (MIRA 17:3)

AKSEL'RUD, Ya.; GERODETSKIY, K.

Simplify the procedure for issuing credit to state farms.
Den. i kred. 16 no.8:62-65 Ag '58. (MIRA 11:9)
(Agricultural credit)

S/0208/64/004/003/0554/0559

ACCESSION NR: AP4037260

AUTHOR: Aksen', M. B. (Minsk)

TITLE: Estimates of approximations by quadrature formulas for certain classes of functions

SOURCE: Zhurnal vy*chislitel'noy matematiki i matematicheskoy fiziki, v. 4, no. 3, 1964, 554-559

TOPIC TAGS: quadrature formula, approximation error, Lipschitz condition, periodic function

ABSTRACT: Let $H_2^{(\alpha)}(M;a,b)$ be the class of functions which are continuous on $[a,b]$ and, for all points $x \pm h \in [a,b]$, satisfy the inequality

$$|f(x+h)+f(x-h)-2f(x)| \leq M|h|^{\alpha} \quad (0<\alpha\leq 1). \qquad (1)$$

Let $MH_2^{(\alpha)}$ be the class of periodic functions of period 2π which satisfy (1) for all x and h. The author gives an exact estimate of the error of approximation of certain quadrature formulas of the form

$$\int_a^b f(x)\,dx \approx \sum_{k=1}^{n} P_k f(x_k) \qquad (2)$$

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AKSEN'T, M.B. (Minsk)

Estimated approximations by quadrature formulas for certain classes of functions. Zhur. vych. mat. i mat. fiz. 4 no.3: 554-559 My-Je '64. (MIRA 17:6)

NOVIK, F.S.; AKSENCHIKOV, A.P.

Measurement of the frequency-contrast characteristics of cinematographic lenses. Usp.nauch.fot. 10:44-49 '64. (MIRA 17:10)

AKSENDARYAN, T. SA.

AKSENENKO, G. A.

Right to land tenure by state farms, machine-tractor stations and auxiliary enterprises Moskva, Gos. izd-vo iurid. lit-ry, 1953. 142 p. (55-23190)

Law

1. Agriculture, Cooperative - Russia. 2. Machine-tractor stations

BOLDYREV, P.I., inzh.; AKSENENKO, M.I., inzh.

Physicomechanical properties of sandstones and siltstones in the Kiselevsk-Prokop'yevsk region of the Kuznetsk Basin. Sbor. KuzNIUI no.9:118-137 '61. (MIRA 16:5)
(Kuznetsk Basin--Siltstone--Testing)
(Kuznetsk Basin--Sandstone--Testing)

S/081/63/000/004/018/051
B166/B186

AUTHORS: Kalabina, A. V., Filippova, A. Kh., Aksenenko, R. A., Latysheva, E. S., Vinogradova, V. V., Zhidyayeva, L. M.

TITLE: Studies in the field of synthesis and conversions of vinylaryl esters. No. 22. Synthesis and certain conversions of vinyl esters and acetals of bromophenols

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 4, 1963, 238 - 239, abstract 4Zh123 (Izv. Fiz.-khim. n.-i. in-ta pri Irkutskom un-te, v. 5, no. 1, 1961, 120 - 130)

TEXT: Vinylation of 2-bromophenol (I) and 4-bromophenol (II) by the Favorskiy - Shostakovskiy method (initial pressure of acetylene 18 - 28 atm 210 - 220°C, 30 - 45 min) in the presence of a large quantity of KOH or NaOH and with high dilution of the reaction mixture with water (sometimes with dioxane added) made possible the synthesis of the vinyl ester of I, yield 40%, b.p. 93 - 94°C/8 mm Hg, $n^{20}D$ 1.5676, d_4^{20} 1.4339, and the vinyl ester of II (III), yield 12 - 52%, b.p. 215 - 216°C/728 mm Hg, 109 - 110°C/11 mm Hg, $n^{20}D$ 1.5685, d_4^{20} 1.4366. The addition of I - II to aliphatic and

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Studies in the field of synthesis...

aromatic vinyl esters (with thorough stirring in the presence of 2 - 4 drops concentrated HCl) gave a series of $CH_3CH(OR)OR'$ acetals (IV). Below are given: the initial vinyl ether, quantity in moles, the initial phenol, quantity in moles, reaction temp. in °C and the reaction time in hrs, R and R' in IV, yield %, b.p. in °C/mm Hg, $n^{20}D$ and d_4^{20}: vinylethyl ether (V), 0.430, I, 0.300, 85 - 90, 1.5, C_2H_5, $O\text{-}BrC_6H_4$, 40, 135/15, 1.5223, 1.3208; V, 0.120, II, 0.058, 70 - 75, 1.5, C_2H_5, $n\text{-}BrC_6H_4$ (IVa), 124 - 125/8, 1.5308, 1.3483; vinylbutyl ether, 0.679, II, 0.579, 75 - 86, 1, C_4H_9, $n\text{-}BrC_6H_4$ (IVb), 38, 155 - 156/17, 1.5051, 1.2364; vinylphenyl ether, 0.167, II, 0.167, 70 - 80, 2, C_6H_5, $n\text{-}BrC_6H_4$, 47.1, 171 - 173/6, 1.5831, 1.3784; III, 0.115, II, 0.104, 70 - 80, 2, $n\text{-}BrC_6H_4$ (IVc), 55, 216 - 217/8, m.p. 46°C, 1.6025, -.

A study was made of substitution of the Br atom in III and IV by ethyl and ethoxyl groups. Experiments to hydrolyze III and IV with dilute alkali to the respective vinyl esters of the phenols (in an autoclave, 220 - 300°C, in the presence of Cu_2Cl_2 and Cu shavings) were unsuccessful. To 53 mmoles IVa in 20 ml cryoscopic C_6H_6 were added 0.08 moles C_2H_5Br and 0.13 moles Na,

Studies in the field of synthesis...

which was thoroughly stirred for 2 hrs at 60 - 65°C and then left to stand for ~12 hrs, whereupon it was filtered through glass wool and distilled, to give IV (R = C_2H_5, R' = n-$C_2H_5C_6H_4$) (IVd), yield 60%, b.p. 93 - 94°C/16 mm Hg, $n^{20}D$ 1.5008, d_4^{20} 0.9851. 5 g IVd and 20 ml 20% H_2SO_4 were heated for 3 hrs at ~100°C to give 4-ethylphenol (VI), yield 88%, b.p. 93 - 95°C/7 mm Hg, $n^{20}D$ 1.5240. In the optimum experiment 0.054 moles IVb, 0.079 moles C_2H_5Br and 0.13 moles Na in 200 ml C_6H_6 were heated for 2 hrs at 80°C and, as stated above, IV were separated (R = C_4H_9, R' = $C_2H_5C_6H_4$), yield 8%, b.p. 140 - 142°C/17 mm Hg, $n^{20}D$ 1.4960, d_4^{20} 0.9275. Under similar conditions (85 - 90°C, 2.5 hrs) the vinyl ester of VI was produced, yield 10%, b.p. 92 - 93°C/18 mm Hg, $n^{20}D$ 1.5148. A mixture of 0.077 moles III, 0.117 moles dry C_2H_5ONa, 10 ml C_6H_6 and 50 g Cu filings was kept at 330°C for 6 hrs; it was then washed with 10% alkali and 4-ethoxyphenol vinyl ester was separated by distillation, yield 40%, b.p. 101 - 102°C/3 mm Hg, $n^{20}D$ 1.5232. See abstract 4Zh122. [Abstracter's note: Complete translation.]

Card 3/3

S/122/60/000/003/002/015
A161/A130

AUTHOR: Aksenenko, V.D., Candidate of Technical Sciences

TITLE: General analysis of hydro-mechanical double-flow transmissions

PERIODICAL: Vestnik mashinostroyeniya, no. 3, 1960, 7 - 13

TEXT: The analysis deals with hydro-mechanical transmissions including torque converters or hydraulic clutches, such as are employed in automobiles, Diesel locomotives, and cranes. The existence of double-flow transmissions is explained with the complexity of system and a long time needed for design development, though the double-flow designs are more complex than uniflow, larger, and less protected from torque fluctuations and shock loads. Proper selection of double flow system and its evaluation is impossible without an analysis of the basic factors, but the formulae are complex even for comparatively simple transmissions, and this presents great difficulties for designers. The author analyzes a part of general aspects of possible double-flow transmissions with three-link differential mechanisms with two degrees of freedom, and suggests a method for their evaluation. Three-link systems (Fig. 1) are divided into two basic types (by the properties): the first with both external and internal gearing, and the

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General analysis ...

second with either external or internal only. Any differential mechanism can give twelve double-flow hydro-mechanical transmissions in different combinations with a torque converter (twelve more could be obtained for the torque converter, but they are of no practical use). All combinations are calculated in charts for the two types, and the work evaluation of each combination is illustrated. Curves characterize the work of transmissions with "Lisholm-Smith" and "Allison" torque converters. The evaluation method is reduced to a simple determination of the combination number, of a corresponding design and curve. The calculation formulae are greatly simplified and their number reduced by introducing into calculation a "B"-parameter presenting the kinematic factor determining (for each different combination) the interdependence of the three ratios of the mechanical reduction gears included into the system before the torque converter pump, in the mechanical transmission branch, and after the torque converter turbine, and the radii-relation factor (C) of the planetary gears (with single or double satellites). There are 5 figures and two charts.

Card 2/3

AKSENENKO, V.D.

General analysis of double-flow hydromechanical transmissions.
Trudy Inst. mash. Sem.po teor. mash. 20 no. 79:44-61 '60.
(Oil hydraulic machinery) (MIRA 13:12)

AKSENENKO, Vasiliy Danilovich, kand. tekhn. nauk, inzhener-podpolkovnik; PETROV, Aleksandr Vladimirovich, inzhener-polkovnik; POCHTAREV, N.F., kand. tekhn. nauk, inzhener-polkovnik, red.; SRIBCHIS, N.V., tekhn. red.

[Planetary and hydraulic transmissions] Planetarnye i gidravlicheskie peredachi. Moskva, Voen.izd-vo M-va obor. SSSR, 1961. 245 p. (MIRA 15:2)
(Automobiles—Transmission devices)
(Vehicles, Military—Transmission devices)

AKSENENKO, V. N.

"Reactions of Organic Halides With Iodine Salts." Cand Chem Sci, Tomsk Polytechnic Inst, Tomsk, 1954. (RZhKhim, No 6, Mar 55)

So: Sum. No 670, 29 Sept 55 - Survey of Scientific and Technical Dissertations Defended a t USSR Higher Educational Institutions (15)

TRONOV, B.V.; AKSENENKO, V.M.

Expansion of the carbon skeleton of molecules during the interaction of iodides with halo organic compounds. Zhur.ob.khim.26 no.5:1393-1397 My '56. (MIRA 9:9)

1.Tomskiy politekhnicheskiy institut.
(Iodides) (Carbon compounds)

AKSENENKO, V. M.

AUTHORS: Onufriyenok, I. P., Aksenenko, V. M. 75-1-20/26

TITLE: A New Method for the Determination of Tellurium (Novyy metod opredeleniya tellura)

PERIODICAL: Zhurnal Analiticheskoy Khimii, 1958, Vol 13, Nr 1, pp 119-122 (USSR)

ABSTRACT: The authors found that tellurites and selenites, but also tellurates and selenates, are reduced to the elements by boiling with milk sugar at a p_H of 10-11. Tellurium is quantitatively deposited as an easily filterable precipitate after 5 to 10 minutes boiling. The velocity of the reduction depends to a considerable degree on the medium and on the temperature. At low temperatures lactose does not even reduce selenium and tellurium in an alkaline solution, whereas on boiling of the solution this reaction proceeds very rapidly. Acid solutions of tellurites are not reduced by lactose. The quantity of the added free lye exerts an influence upon the type of the precipitate and upon the reduction itself. In the case of a deficiency of lye the reduction is considerably re-

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tarded and a finely distributed precipitate, that is difficult to filter, forms. With a high excess of lye tellurium is not quantitatively deposited. In the case of a correct quantity of lye the color of the solution after boiling is cherry-red, in the case of a deficiency of lye it is greenish-cherry red, in the case of an excess of lye it is dark cherry-red with a tinge of raspberry-red. After the reduction with lactose in a weakly alkaline solution the deposited tellurium is gravimetrically or titrimetrically determined. The most important titrimetric methods of determination for tellurium are based on the oxidation of the tellurite-ion with potassium permanganate or potassium bichromate. Freshly precipitated tellurium is well soluble in an acidified solution of potassium biochromate, where it is oxidized to telluric acid

$$Te + Cr_2O_7^{2-} + 6H^+ = TeO_4^{2-} + 2Cr^{3+} + 3H_2O.$$

This fact was developed to a quantitative method of determination for tellurium. The equivalent weight of tellurium in this reaction amounts to 21,27. It is expedient to take sulfuric acid and not hydrochloric acid for acidifying the bi-

chromate solution, as sulfuric acid on heating reduces the formed hexavalent tellurium to tetravalent tellurium. This titrimetric method was especially employed for the determination of tellurium in its alloys with antimony. In order to keep antimony in the solution, the alloy is worked up with a mixture of nitric acid and tartaric acid. Besides antimony and tellurium the alloy can also contain small quantites of iron, arsenic, tin, lead, cadmium, bismuth, carbon, selenium, copper, and other elements. The compounds of iron, arsenic, bismuth, tin, and antimony are not reduced to the metals by lactose in a weakly alkaline solution. They are kept in solution by tartaric acid. At higher concentrations tin may go into the precipitate. This renders determination considerably difficult, as an amorphous finely distributed precipitate forms, which consists of tellurium and tin compounds, and which it is difficult further to work up. At a low content of tin this difficulty does not exist. The presence of small quantites of lead and cadmium do not disturb tellurium determination. Carbon does not dissolve in nitric acid and can be removed by filtering. Copper and selenium disturb the analysis

considerably as they are precipitated together with tellurium in the reduction with lactose. By the addition of potassium ferrocyanide, however, it can be brought about that selenium and copper in weakly alkaline solutions are not reduced to the metals, but that they remain in solution as stable complex compounds. At the same time potassium ferrocyanide does not prevent the reduction of tellurium nor does it exercise any influence upon the velocity of the separation. The results show that this method yields well reproducible results. The deviations from a mean value in the case of a tellurium content of ~3 % are not higher than 0,02 % and in the case of a tellurium content of ~10 % not higher than 0,03 %. The experimental conditions of all these determinations are exactly given. There are 2 tables and 4 references, 1 of which is Slavic.

ASSOCIATION: Tomsk Polytechnic Institute (Tomskiy politekhnicheskiy institut)

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1. Tellurium - Determination